CLAIMS

1. An optical information recording medium, comprising:

a substrate; and

at least n information layers (where n is an integer of at least 3) provided on the substrate,

wherein each of the n information layers comprises a recording layer comprising Te, O and M, where M denotes at least one element selected from the group consisting of Al, Si, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, Zr, Nb, Mo, Ru, Rh, Pd, Ag, In, Sn, Sb, Hf, Ta, W, Re, Os, Ir, Pt, Au and Bi, and

when the n information layers are represented as a first to a n-th information layers from a laser beam incident side, assuming that C(j)% denotes a concentration of oxygen atoms contained in the recording layer included in a j-th information layer (where j is an integer satisfying $1 \leq j \leq n-1$), C(1) to C(n−1) satisfy the following relationships:

$C(1) \geq C(2) \geq \ldots \geq C(n-2) \geq C(n-1)$, and

$C(1) \neq C(n-1)$.

2. The optical information recording medium according to claim 1, wherein assuming that C(n)% denotes a concentration of oxygen atoms contained in the recording layer in the n-th information layer, C(n−1) and C(n) satisfy the following relationship:

$C(n-1) \geq C(n)$.

3. The optical information recording medium according to claim 1,

wherein the n-th information layer further comprises a reflective layer that is disposed on an opposite side of the laser beam incident side with reference to the recording layer included in the n-th information layer, and

the reflective layer is made of a material having a refractive index of 3 or less and an extinction coefficient of 1 or more.

4. The optical information recording medium according to claim 1,

wherein at least one information layer of the first to the n-th information layers further comprises a protective layer that is disposed on at least one side of the laser beam incident side and an opposite side of the

laser beam incident side with reference to the recording layer included in the at least one information layer, and

the protective layer is made of a dielectric material having a refractive index of 1.5 or more.

5. An optical information recording medium, comprising:

a substrate; and

a first information layer and a second information layer provided in this stated order from a laser beam incident side on the substrate,

wherein each of the first information layer and the second information layer comprises a recording layer comprising Te, O and M, where M denotes at least one element selected from the group consisting of Al, Si, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, Zr, Nb, Mo, Ru, Rh, Pd, Ag, In, Sn, Sb, Hf, Ta, W, Re, Os, Ir, Pt, Au and Bi, and

a concentration of oxygen atoms contained in the recording layer included in the first information layer is larger than a concentration of oxygen atoms contained in the recording layer included in the second information layer.

6. The optical information recording medium according to claim 5,

wherein the second information layer further comprises a reflective layer that is disposed on an opposite side of the laser beam incident side with reference to the recording layer included in the second information layer, and

the reflective layer is made of a material having a refractive index of 3 or less and an extinction coefficient of 1 or more.

7. The optical information recording medium according to claim 5,

wherein at least one information layer of the first information layer and the second information layer further comprises a protective layer that is disposed on at least one side of the laser beam incident side and an opposite side of the laser beam incident side with reference to the recording layer included in the at least one information layer, and

the protective layer is made of a dielectric material having a refractive index of 1.5 or more.

8. A method for manufacturing an optical information recording

medium comprising n information layers (where n is an integer of at least 3) provided on a substrate, the method comprising the steps of:

forming an information layer comprising a recording layer comprising Te, O and M, where M denotes at least one element selected from the group consisting of Al, Si, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, Zr, Nb, Mo, Ru, Rh, Pd, Ag, In, Sn, Sb, Hf, Ta, W, Re, Os, Ir, Pt, Au and Bi, the step being performed n times,

wherein when the information layers formed in the information layer formation steps are represented as a first to a n-th information layers from a laser beam incident side, assuming that C(j)% denotes a concentration of oxygen atoms contained in the recording layer included in a j-th information layer (where j is an integer satisfying $1 \leq j \leq n-1$), the first to the n-th information layers are formed so that C(1) to C(n−1) satisfy the following relationships:

$C(1) \geq C(2) \geq \ldots \geq C(n-2) \geq C(n-1)$, and

$C(1) \neq C(n-1)$.

9. A method for manufacturing an optical information recording medium comprising two information layers provided on a substrate, the method comprising the steps of:

forming an information layer comprising a recording layer comprising Te, O and M, where M denotes at least one element selected from the group consisting of Al, Si, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, Zr, Nb, Mo, Ru, Rh, Pd, Ag, In, Sn, Sb, Hf, Ta, W, Re, Os, Ir, Pt, Au and Bi, the step being performed twice,

wherein when the information layers formed in the information layer formation steps are represented as a first information layer and a second information layer from a laser beam incident side, the first information layer and the second information layer are formed so that a concentration of oxygen atoms contained in the recording layer included in the first information layer is larger than a concentration of oxygen atoms contained in the recording layer included in the second information layer.

10. The method for manufacturing an optical information recording medium according to claim 8 or 9, wherein, in the information layer formation steps, at least after the formation of the recording layer, annealing is performed so as to keep the recording layer at 60°C or more for

5 minutes or more.